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three to seventy-one metres annually. The retreat or advance of a glacier depends "on changes of long periodicity in meteorological conditions—heat, moisture, winds."——In the *Am. Journal of Science* Dr. R. W. Coppinger has some interesting observations upon the movement of the soil-cap on the shores of Western Patagonia. Evergreen forests and brushwood cover the shore hills to a height of one thousand feet, and gravitation, acting on this mass of vegetation and the soil beneath, resting on a surface already planed by ice-action, causes the whole to slide downward to the water, which removes its free edge in much the same way that the end of a Greenland glacier is removed.——The Report on the Geological and Natural History Survey of Minnesota, for 1880, contains a descriptive list of rocks, descriptions of three new Lower Silurian Brachiopods, and a note on the Cupriferous series by Professor Winchell; also an account of the Glacial phenomena of the State and the district north and west of it, by Warren Upham.

GEOGRAPHY AND TRAVELS.[1]

Dr. Lenz on the Sahara.—Dr. Oscar Lenz gives in the last number of the *Zeitschrift* of the Berlin Geographical Society[2] an account of the results of his journey across the Sahara, from Tanger to Timbuktu, and thence to Senegambia. The following good abridgement of his paper we take from the *Nature:*

"The real journey was begun at Marrakesh, at the northern foot of the Atlas mountains, where Dr. Lenz laid in his store of provisions and changed his name and dress, traveling further under the disguise of a Turkish military surgeon. He crossed the Atlas and the Anti-Atlas in a south-western direction. The Atlas consists, first, of a series of low hills belonging to the Tertiary and Cretaceous formations, then of a wide plateau of red sandstone, probably Triassic, and of the chief range, which consists of clay-slates with extensive iron ores. The pass of Bibanan is 1250 metres above the sea-level, and it is surrounded with peaks about 4000 metres high, whilst the Wad Sus valley at its foot is but 150 metres above the sea. The Anti-Atlas consists of Palæozoic strata. On May 5, 1880, Dr. Lenz reached Tenduf, a small town founded some thirty years ago, and promising to acquire great importance as a station for caravans. The northern part of the Sahara is a plateau 400 metres high, consisting of horizontal Devonian strata which contain numerous fossils. On May 15 Dr. Lenz crossed the moving sand-dunes of Igidi, a wide tract where he observed the interesting phenomenon of musical sand, a sound like that of a trumpet being produced by the friction of the small grains of quartz. But amidst these moving dunes it is not uncommon to find some grazing places for camels, as well as flocks of gazelles and antelopes. At El Eglab Dr. Lenz found granite and porphyry, and was fortunate enough to have rain. Thence the character of the desert becomes more varied, the route crossing sometimes sandy and sometimes stony tracts or sand-dunes, with several dry river beds running east and west between them. On May 29 he reached the salt works of Taudeni and visited the ruins of a very ancient town where numerous stone implements have been found. Here he crossed a depression of the desert only 145 to 170 metres high, while the remainder of the desert usually reaches as much as 250 to 300 metres above the sea-level; and he remarks that throughout his journey he did not meet with depressions below the sea-level. The schemes for flooding the Sahara are therefore hopeless and misleading. The landscape remained the same until the wide Alfa fields which extend north of Arauan. This little town is situated amidst sand-dunes devoid of vegetation, owing to the hot southern winds. Four days later Dr. Lenz was in Timbuktu, whence he proceeded west to St. Louis. During his forty-three days' travel through the Sahara Dr. Lenz observed that the temperature was not excessive; it usually was from 34° to 36° Celsius, and only in the Igidi region it reached 45°. The wind blew mostly from north-west, and it was only south of Taudeni that the traveler experienced the hot south winds [*edrash*] of the desert. As to the theory of north-eastern trade winds being the cause of the formation of the desert, Dr. Lenz remarks that he never observed such a wind, nor did his men; it must be stopped by the hilly tracts of the north.

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[1] Edited by Ellis H. Yarnall, Philadelphia.

[2] Kurzer Bericht über meine Reise von Tanger nach Timbuktu und Senegambien. Von Dr. Oscar Lenz. *Zeitschrift der Gesellschaft für Erdkunde zu Berlin.* Nos. 94, 95, p. 272. It is accompanied by a large map of his route. Scale 1 : 1,500,000. Drawn by Dr. R. Kiepert.

"Another important remark of Dr. Lenz is what he makes with respect to the frequent description of the Sahara as a sea-bed. Of course it was under the sea, but during the Devonian, Cretaceous and Tertiary periods; as to the sand which covers it now, it has nothing to do with the sea; it is the product of the destruction of sandstones by atmospheric agencies. Northern Africa was not always a desert, and the causes of its being so now must be sought for, not in geological but in meterological influences."

ARCTIC EXPLORATION.—Up to the middle of June last the edge of the ice extended in an east and west direction at a distance of only sixty to one hundred miles from the coast of Finmark. It trended north-eastward toward Novaya Zemlya, and swept round at a distance of about thirty miles from Matyushin Strait, towards the entrance of the White Sea. With the probable exception of 1867, the ice was then nearer to the northern coast of Norway than it was ever known to be before. After the middle of August the ice disappeared off Novaya Zemlya, and there was probably open water to Franz-Josef Land. It is stated in the Royal Geographical Societies' *Proceedings* that "the collective evidence shows that the prevailing northerly and north-westerly winds of last winter packed the ice in a broad belt across the Spitzbergen and Barent's Seas.

The southern edge of this belt was exceptionally low down along the north coast of Norway, while the northern edge nearly reached the south point of Spitzbergen. The southern pack-edge showed little alteration during May and June, but gave way rapidly when it fairly began to melt—about the beginning of July—as the ice was on the whole of no great thickness. The climatic conditions north and south of the belt seems to have differed considerably during the winter. In the north of Norway heavy falls of snow were unusually frequent, while north of the belt the fall was comparatively slight. So early as the end of June the winter snow had in great measure disappeared even from the highlands of Spitzbergen and Novaya Zemlya, while in the northern part of Norway it lay thickly, down to the very water's edge. On arriving at Spitzbergen the walrus hunters also found vegetation unusually far advanced. Thus since large masses of ice were blown southward during the winter of 1880–1, it is highly probable that the Polar regions were fairly free from ice early in the summer, while the autumn must have offered exceptionally favorable conditions for an advance to the northward or north-eastward. This supposition is strongly confirmed by reports from the walrus grounds northward of Spitzbergen. With regard to the Kara Sea, it seems that it was not accessible from the westward till about the beginning of August. But while a heavy, solid pack extended northward from the Kara Strait along the east coast of Novaya Zemlya, the eastern part of the Kara Sea was certainly free from ice by the beginning of August, and very probably by the middle of July. In August and September, therefore, vessels from Europe could undoubtedly have reached the mouth of the Yenisei."

It is probable the *Eira* took advantage of the disappearance of the ice in August, as mentioned above, to make her way to Franz Josef Land.

Lieutenant Berry, of the *Rodgers*, found the sea becoming deeper as he sailed to the north-eastward from Wrangell Island. His observations off Herald Island indicate that there is no regular current flowing to the north-west, as previously supposed. No perceptible current was noticed at low and high water—the only movement being caused by the tidal action.

The expedition sent out by the Danish Government last summer to Greenland, has returned home. It proceeded to the southernmost part of Greenland and succeeded in circumnavigating the large islands on the southern coast and in determining the exact position of Cape Farewell. Investigations were conducted on the mainland from the Tasermint Fjord on the west coast to the Lindenows Fjord on the east coast.

There are high mountains and enormous glaciers on the west side. The eastern section is of lower elevation, and covered with a layer of ice and snow with the exception of a few mountain peaks.

Mr. Dall, in an elaborate paper on the hydrology of Behring Sea, in *Petermann's Mittheilungen*, concludes that the warm surface water which enters the Polar Sea through Behring Strait is, at most, capable of melting 5100 square inches of ice, and that its influence is consequently insignificant. No branch of the Kuro Siwo enters the Behring Sea, and the currents in the Polar basin to the north of it, are mainly dependent upon the winds. There is no reason to suppose that these drift currents are capable of opening passages through the pack-ice which would enable exploring vessels to reach the Pole or even a very high latitude.

The British Government are considering a plan for the establishment of a meteorological station at Fort Simpson, on the Mackenzie River, to be conducted on the system adopted by the International Polar Conference.

Lake Onega may be considered to mark the natural boundary between Northern Russia and Finland, as regards their geological structure, topographical features, fauna and flora.

MICROSCOPY.[1]

THE ACME MICROSCOPES.—These really excellent instruments, combining good workmanship with moderate cost, and built upon a model which comprises many of the most convenient and serviceable of recent improvements in the construction of stands, have passed into the hands of James W. Queen & Co., of Philadelphia, who will act as business agents for their sale, and whose great business facilities cannot fail to secure for them a more general and adequate appreciation and attention than they have yet received. A " No. 4 " stand, simpler and smaller than those formerly made, and a " lithological," specially adapted to the examination of rocks, are among the recent additions to the Acme series.

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SCIENTIFIC NEWS.

— A French naval doctor, M. Crevaux, has lately made important explorations in the northern parts of South America, more especially in the valley of the Orinoco and its affluents. Among other facts of observation, he states that the Guaraunos, at the delta of that river, take refuge in the trees when the delta is inundated. There they make a sort of dwelling with branches and clay. The women light, on a small piece of floor, the fire needed for cooking, and the traveler on the river by night often sees with surprise long rows of flames at a considerable height in the air. The Guaraunos dispose of their dead by hanging them

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[1] This department is edited by Dr. R. H. WARD, Troy, N. Y.